

WE CLAIM:

1. A method for providing an inbound call service to a public switched telephone network (PSTN) service subscriber, the method comprising:

receiving a call initiation message at a call service node (CSN) that does not complete the call in the PSTN;

extracting a called number from the call initiation message, and identifying the service subscriber associated with the called number;

issuing an inbound call notification message over a messaging network to at least one messaging device operated by the service subscriber, the inbound call notification message providing information related to the inbound call and requesting that the service subscriber select a call treatment option for the inbound call;

routing the call to a call parking facility associated with the service;

receiving from the service subscriber a reply to the inbound call notification message indicating the call treatment option; and

controlling the call from the CSN in accordance with the call treatment option.
2. The method as claimed in claim 1 wherein prior to receiving the call initiation message at the CSN, the method further comprises steps of:

receiving a dialed number at a service switching point that serves a calling party that initiated the inbound call;

translating the dialed number and determining that the dialed number is a ported number;

querying a service control point for routing instructions for completing the call to the dialed number; and

formulating the call initiation message in response to receipt of the routing instructions from the service control point.

3. The method as claimed in claim 2 wherein formulating the call initiation message comprises formulating an Initial Address Message containing a routing code for routing the Initial Address Message to the CSN.

4. The method as claimed in claim 1 wherein identifying the service subscriber comprises:

extracting the called number from the call initiation message and using the called number in a query to retrieve a service subscriber profile that stores default information about how calls to the service subscriber are to be handled.

5. The method as claimed in claim 4 wherein issuing an inbound call notification message comprises:

examining the service subscriber profile to identify at least one messaging network address specified by the service subscriber; and

formulating and sending an inbound call notification message to each messaging network address

specified in the service subscriber profile, a format of each inbound call notification message being determined by characteristics of the messaging network through which the inbound call notification message is sent.

6. The method as claimed in claim 1 wherein routing the call to a call parking facility comprises routing the call to an announcement player that requests that the caller wait while the call is being processed.
7. The method as claimed in claim 1 wherein routing the call to a call parking facility comprises routing the call to a voice mail box.
8. The method as claimed in claim 7 wherein the reply received from the service subscriber requests voice mail monitoring and the method further comprises:
activating a trunk monitor connected to a trunk facility through which the call is routed;
converting monitored content into a format compatible with a one of the at least one client device from which the reply was received; and
forwarding the converted monitored content to the client device from which the reply was received, to permit the service subscriber to listen to the voice mail message in real time.
9. The method as claimed in claim 8 wherein converting monitored content comprises converting pulse code modulated data to a streaming audio format.

10. The method as claimed in claim 7 wherein routing the call to a call parking facility comprises:

extracting the called number from the call initiation message and using the called number in a query to retrieve a service subscriber profile;

extracting a calling party number from the call initiation message;

searching the caller profile to determine whether the calling party number is associated with a specific voice mail box to which the call is to be routed; and

if the calling party number is associated with a specific voice mail box, routing the inbound call to the specific voice mail box, otherwise routing the call to one of an announcement player and a default voice mail box specified in the service subscriber profile.

11. The method as claimed in claim 10 wherein routing the call to the voice mail box comprises modifying the call initiation message by inserting an address of the voice mail box into a called number field of the call initiation message, and inserting a subscriber telephone number associated with the voice mail box in a redirecting number field of the call initiation message, if the subscriber telephone number associated with the voice mail box is different from the dialed telephone number in the original called number field of the call initiation message.

12. The method as claimed in claim 4 wherein controlling the call from the CSN comprises releasing the call

from the call parking facility and reconnecting the call to a telephone number specified in the reply, if the reply is received before a predetermined period of time lapses, and applying a default call treatment option specified in the service subscriber profile if the reply is not received before the predetermined time lapses.

13. The method as claimed in claim 12 wherein the default call treatment option is determined by a time of day and day of week.
14. The method as claimed in claim 12 wherein the default call treatment option is forwarding the call to a voice mail box.
15. The method as claimed in claim 12 wherein reconnecting the call to a telephone number specified in the reply comprises one of: reconnecting the call to a directory number specified in the service subscriber profile; reconnecting the call to a service-subscriber-selected one of a plurality of telephone numbers specified in the service subscriber profile; and, reconnecting the call to a telephone number supplied by the service subscriber in the reply to the inbound call notification message.
16. The method as claimed in claim 1 further comprising storing a number of a calling party so that if the reply is received after the calling party has terminated the call, the CSN can use information in the reply and the stored number of the calling party to automatically establish a call between the service subscriber and the calling party.

17. A system for interactive real-time inbound call screening, comprising:
- a call service node (CSN) connected to a common channel signaling network of a public switched telephone network, the CSN being associated with selected trunk resources in a bearer network of the PSTN;
 - a call control application (CCA) for receiving a content of common channel signaling messages from the CSN, and directing the CSN to selectively formulate and issue common channel signaling messages to PSTN switches that support the trunk resources, the CCA being adapted to request formulation and transmission of at least one inbound call notification message to a service subscriber upon receipt of a call initiation message addressed to a telephone number associated with the service subscriber, the at least one inbound call notification message providing information to the service subscriber about the inbound call and requesting selection of a call treatment option for handling the inbound call from the service subscriber; and
 - at least one call parking facility to which the CSN can route inbound calls to service subscribers, pending a receipt by the CCA of instructions in a reply to one of the at least one messaging network message, the reply providing information about how the respective calls are to be treated.
18. The system as claimed in claim 17 wherein the CCA is further adapted to:

receive the reply from the service subscriber;
extract the information about how the call is to be
treated; and

direct the CSN to release the call from the call
parking facility, and to reconnect the call in
accordance with the information about how the
call is to be treated.

19. The system as claimed in claim 17 further comprising a database for storing service subscriber profile records for specifying default call treatment for inbound telephone calls to each service subscriber.
20. The system as claimed in claim 17 wherein the call parking facility comprises a service subscriber's voice mail box.
21. The system as claimed in claim 17 further comprising a trunk monitor connected to at least one of the selected trunk resources in the PSTN, the monitor being controllable to selectively sample voice data on the one of the selected trunk resources.
22. The system as claimed in claim 21 further comprising a means for dynamically converting the voice data into a format compatible with a messaging device used to send a reply to the CCA in response to the inbound call notification message.
23. The system as claimed in claim 20 wherein the CCA is further adapted to route inbound calls to a plurality of dialed numbers associated with a given service

subscriber to a single voice mail box associated with the service subscriber.

24. The system as claimed in claim 20 wherein the CCA is further adapted to route inbound calls to a single service subscriber number to a plurality of voice mail boxes, depending on a calling party number extracted from a call initiation message associated with the inbound call and information specified in a user profile record associated with the service subscriber.

25. The system as claimed in claim 17 wherein the CCA is adapted to formulate and transmit the inbound call notification message in any one of a Short Message Service protocol, a Wireless Application Protocol, an Instant Message protocol, and a Partial Collision Detection protocol.

26. A method for providing single number service to a public switched telephone network (PSTN) service subscriber, comprising:

receiving a call initiation message at a call service node (CSN) that does not complete the call in the PSTN;

extracting a called number from the call initiation message, and using the called number to identify the service subscriber;

issuing an inbound call notification message over a messaging network to at least one messaging device operated by the service subscriber, the inbound call notification message providing information related to the inbound call and

requesting that the service subscriber select a call treatment option for the inbound call;

routing the call to a call parking facility associated with the service;

receiving from the service subscriber a reply to the inbound call notification message indicating the call treatment option; and

controlling the call from the CSN in accordance with the call treatment option.

27. The method as claimed in claim 26 wherein prior to receiving the call initiation message at the CSN, the method further comprises steps of:

receiving a dialed number at a service switching point that serves a calling party that initiated the inbound call;

translating the dialed number and determining that the dialed number is a ported number;

querying a service control point for routing instructions for completing the call to the dialed number; and

formulating the call initiation message in response to receipt of the routing instructions from the service control point.

28. The method as claimed in claim 27 wherein formulating the call initiation message comprises formulating an Initial Address Message containing a routing code for routing the Initial Address Message to the CSN.

29. The method as claimed in claim 26 wherein identifying the service subscriber comprises:

extracting the called number from the call initiation message and using the called number in a query to retrieve a service subscriber profile that stores the plurality of directory numbers and other default information about how calls to the service subscriber are to be handled.

30. The method as claimed in claim 29 wherein issuing an inbound call notification message comprises:

examining the service subscriber profile to identify at least one messaging network address specified by the service subscriber; and

formulating and sending an inbound call notification message to each messaging network address specified in the service subscriber profile, a format of each inbound call notification message being determined by characteristics of the messaging network through which the inbound call notification message is sent, and each inbound call notification message containing a list of the directory numbers associated with the service subscriber.

31. The method as claimed in claim 30 further comprising formulating the inbound call notification message to include an option to permit the service subscriber to specify a directory number that is different from the plurality of directory numbers in the service subscriber profile.

32. The method as claimed in claim 30 wherein routing the call to a call parking facility comprises routing the

call to an announcement that requests that the caller wait while the call is being processed.

33. The method as claimed in claim 26 wherein routing the call to a call parking facility comprises routing the call to a voice mail box.

34. The method as claimed in claim 33 wherein routing the call to a call parking facility comprises:

extracting the called number from the call initiation message and using the called number in a query to retrieve a service subscriber profile;

extracting a calling party number from the call initiation message;

searching the caller profile to determine whether the calling party number is associated with a specific voice mail box to which the call is to be routed; and

if the calling party number is associated with a specific voice mail box, routing the inbound call to the specific voice mail box, otherwise routing the call to one of an announcement player and a default voice mail box specified in the service subscriber profile.

35. The method as claimed in claim 34 wherein routing the call to the voice mail box comprises modifying the call initiation message by inserting an address of the voice mail box into a called party number field of the call initiation message, and inserting a one of the subscriber telephone numbers associated with the voice mail box in a redirecting number field of

the call initiation message, if the subscriber telephone number associated with the voice mail box is different from the client telephone number in the called number field of the call initiation message.

36. The method as claimed in claim 29 wherein controlling the call from the CSN comprises releasing the call from the call parking facility and reconnecting the call to the directory number specified in the reply, if the reply is received before a predetermined period of time lapses, and applying a service subscriber directory number specified in the service subscriber profile if the reply is not received before the predetermined time lapses.
37. The method as claimed in claim 36 wherein the service subscriber directory number is selected based on a time of day and day of week.
38. The method as claimed in claim 37 further comprising storing a number of a calling party so that if the reply is received after the calling party has terminated the call, the CSN can use the directory number specified in the reply, and the stored number of the calling party, to automatically establish a call between the service subscriber and the calling party.